

### **Abstract**

This invention relates to a multiphase reactor which is especially suitable for desulfurization of flue gas. A rotary build-in member comprising a rotator and an  
5 annular rotator is fixed on the shell of the reactor. The shell is cylindrical, and its surface is smooth or waved. The maximum diameter of the rotator is no less than the inner diameter of the annular rotator. The rotator is installed on the annular rotator coaxially. One rotary build-in member and its corresponding shell constitute an unit, and the reactor may have one or more such units. The multiphase reactor can  
10 effectively improve the flow pattern of the fluid and the contact of gas-liquid-solid three-phase of the reactants, speed up the mass transfer, and prevent deposition of the solid phase. The reactor is simple in structure and convenient for use. It can be used in the fields such as environmental protection, chemical engineering, metallurgy, and architectural industries.

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